REMARKS

1. Claims 23, 35, 38, 42 and 49 are amended. Claims 50 and 51 are new. The claim amendments are to correct grammatical errors in the claims and are not related to patentability. A marked-up version of the amended claims is attached hereto.

2. A check in the amount of $160.00 is enclosed on account of the additional claims fee.

The Commissioner is hereby authorized to charge payment for any fees associated with this communication or credit any over payment to Deposit Account No. 16-1350.

Respectfully submitted,

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CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service on the date indicated below as first class mail in an envelope addressed to the Commissioner of Patents, Washington, D.C. 20231.

Date: 12|3|01

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Application No.: 09/954,608

Marked Up Claim(s)

23. (Amended) A video coder for coding an image comprising pixels arranged in rows and columns and represented by values having a specified dynamic range, the pixels in the rows residing at unit horizontal locations and the pixels in the columns residing at unit vertical locations, the video coder comprising an interpolator adapted to generate values for sub-pixels at fractional horizontal and vertical locations, the fractional horizontal and vertical locations being defined according to [1/2x] $1/2^x$ where x is a positive integer having a maximum value N, the interpolator being adapted to:

a) interpolate values for sub-pixels at $1/2^{N-1}$ unit horizontal and unit vertical locations, and unit horizontal and $1/2^{N-1}$ unit vertical locations directly using weighted sums of pixels residing at unit horizontal and unit vertical locations;

b) interpolate values for subpixels at $1/2^{N-1}$ unit horizontal and $1/2^{N-1}$ unit vertical locations directly using a choice of a first weighted sum of values for sub-pixels residing at $1/2^{N-1}$ unit horizontal and unit vertical locations and a second weighted sum of values for sub-pixels residing at unit horizontal and $1/2^{N-1}$ unit vertical locations, the first and second weighted sums of values being calculated according to step (a); and

c) interpolate a value for a sub-pixel situated at a $1/2^N$ unit
   horizontal and $1/2^N$ unit vertical location by taking a
   weighted average of the value of a first sub-pixel or pixel
   situated at a $1/2^{N-m}$ unit horizontal and $1/2^{N-n}$ unit vertical
   location and the value of a second sub-pixel or pixel
   located at a $1/2^{N-p}$ unit horizontal and $1/2^{N-q}$ unit vertical
   location, variables m, n, p and q taking integer values in
   the range 1 to N such that the first and second sub-pixels
   or pixels are located diagonally with respect to the sub-
   pixel at $1/2^N$ unit horizontal and $1/2^N$ vertical location.

35. (Amended) A video coder for coding an image comprising
pixels arranged in rows and columns and represented by values
having a specified dynamic range, the pixels in the rows
residing at unit horizontal locations and the pixels in the
columns residing at unit vertical locations, the coder
comprising an interpolator adapted to generate values for sub-
pixels at fractional horizontal and vertical locations, the
resolution of the sub-pixels being determined by a positive
integer N, the interpolator being adapted to:

a) interpolate values for sub-pixels at $1/2^{N-1}$ unit horizontal
   and unit vertical locations, and unit horizontal and $1/2^{N-1}$
   unit vertical locations directly using weighted sums of
   pixels residing at unit horizontal and unit vertical
   locations;

b) interpolate a value for a sub-pixel at a sub-pixel
   horizontal and sub-pixel vertical location [is required]
   directly using a choice of a first weighted sum of values
   for sub-pixels located at a vertical location corresponding

to that of the sub-pixels being calculated and a second weighted sum of values for sub-pixels located at a horizontal location corresponding to that of the sub-pixel being calculated.

38. (Amended) A [method] <u>video coder</u> according to claim 35 in which the interpolator is further adapted to interpolate values for sub-pixels at $1/2^N$ unit horizontal and $1/2^N$ unit vertical locations by taking the average of at least one pair of a first pair of values of a sub-pixel located at a $1/2^{N-1}$ unit horizontal and unit vertical location, and a sub-pixel located at a unit horizontal and $1/2^{N-1}$ unit vertical location and a second pair of values of a pixel located at a unit horizontal and unit vertical location, and a sub-pixel located at a $1/2^{N-1}$ unit horizontal and $1/2^{N-1}$ unit vertical location.

42. (Amended) A communications terminal comprising a video coder for coding an image comprising pixels arranged in rows and columns and represented by values having a specified dynamic range, the pixels in the rows residing at unit horizontal locations and the pixels in the columns residing at unit vertical locations, the coder comprising an interpolator adapted to generate values for sub-pixels at fractional horizontal and vertical locations, the resolution of the sub-pixels being determined by a positive integer N, the interpolator being adapted to:

a) interpolate values for sub-pixels at $1/2^{N-1}$ unit horizontal and unit vertical locations, and unit horizontal and $1/2^{N-1}$ unit vertical locations directly using weighted sums of

pixels residing at unit horizontal and unit vertical locations;

b) interpolate a value for a sub-pixel at a sub-pixel horizontal and sub-pixel vertical location [is required] directly using a choice of a first weighted sum of values for sub-pixels located at a vertical location corresponding to that of the sub-pixel being calculated and a second weighted sum of values for sub-pixels located at a horizontal location corresponding to that of the sub-pixel being calculated.

46. (Amended) A telecommunications system comprising a communications terminal and a network, the telecommunications network and the communications terminal being connected by a communications link over which coded video can be transmitted, the communications terminal comprising a video coder for coding an image comprising pixels arranged in rows and columns and represented by values having a specified dynamic range, the pixels in the rows residing at unit horizontal locations and the pixels in the columns residing at unit vertical locations, the coder comprising an interpolator adapted to generate values for sub-pixels at fractional horizontal and vertical locations, the resolution of the sub-pixels being determined by a positive integer N, the interpolator being adapted to:

a) interpolate values for sub-pixels at $1/2^{N-1}$ unit horizontal and unit vertical locations, and unit horizontal and $1/2^{N-1}$ unit vertical locations directly using weighted sums of pixels residing at unit horizontal and unit vertical locations;

b) interpolate a value for a sub-pixel at a sub-pixel horizontal and sub-pixel vertical location [is required] directly using a choice of a first weighted sum of values for sub-pixels located at a vertical location corresponding to that of the sub-pixel being calculated and a second weighted sum of values for sub-pixels located at a horizontal location corresponding to that of the sub-pixel being calculated.

49. (Amended) A telecommunications system comprising a communications terminal and a network, the telecommunication network and the communications terminal being connected by a communications link over which coded video can be transmitted, the network comprising a video coder for coding [for coding] an image comprising pixels arranged in rows and columns and represented by values having a specified dynamic range, the pixels in the rows residing at unit horizontal locations and the pixels in the columns residing at unit vertical locations, the coder comprising an interpolator adapted to generate values for sub-pixels at fractional horizontal and vertical locations, the resolution of the sub-pixels being determined by a positive integer N, the interpolator being adapted to:

a) interpolate values for sub-pixels at $1/2^{N-1}$ unit horizontal and unit vertical locations, and unit horizontal and $1/2^{N-1}$ unit vertical locations directly using weighted sums of pixels residing at unit horizontal and unit vertical locations;

b) interpolate a value for a sub-pixel at a sub-pixel horizontal and sub-pixel vertical location [is required]

directly using a choice of a first weighted sum of values for sub-pixels located at a vertical location corresponding to that of the sub-pixel being calculated and a second weighted sum of values for sub-pixels located at a horizontal location corresponding to that of the sub-pixel being calculated.